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tenders him its thanks for the zeal and fidelity with which he has performed the duties of the office during his incumbency.

On motion, also *Resolved*, That at the next meeting for business, the Society proceed to the election of a Recording Secretary.

## ELECTION.

M. Carey Lea, Moses H. Emery, Benjamin J. Kern, M. D., and F. W. Sargent, M. D., of Philadelphia, were elected *Members*; and Jacob Sturm, Esq., of Nüremberg, was elected a *Correspondent*.

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*Stated Meeting, October 5, 1847.*

Vice President MORTON in the Chair.

## DONATIONS TO MUSEUM.

Ocypoda Urvillii, from the Pacific Coast. From Dr. Joseph Wilson, U. S. Navy.

Transverse section of a fossil tree, 18 inches diameter, from Athens, Ohio, and numerous specimens, in spirits, of reptiles, from the south-western part of the United States. From Dr. S. P. Hildreth.

Fossil coniferous wood and bark. From Professor Johnson. A number of American Reptiles. From Dr. George Spackman.

Platycarcinus ———? from Tampa Bay, Florida. From Mr. T. A. Conrad.

Apus longicaudatus; from the Rocky Mountains. From Dr. J. L. Le Conte.

## DONATIONS TO LIBRARY.

Transactions of the Botanical Society of Edinburgh. Vol. 2, parts 1, 2 and 3. Edinburgh, 1845—46. From Dr. Balfour, of Glasgow, through Dr. Watson.

**Memoir on the fossil genus *Basilosaurus*, with a notice of specimens from the Eocene green sand of South Carolina.** By Robert W. Gibbes, M. D., of Columbia, S. C. (From the Journal of the Acad. of Nat. Sci. of Philada., vol. 1, 2d series.) 4to. Philada. 1847. From the author.

**A synopsis of the Birds of North America.** By J. J. Audubon. 8vo., Edinburgh, 1839. From Dr. Wilson.

**Annales des Lagides, ou Chronologie des rois Grecs d'Égypte successeurs d'Alexandre le grand.** Par M. Champollion Figeac. 2 vols., 8vo. Paris, 1819. From the author.

**Le Sahara Algérien, études géographiques, statistiques, et historiques sur la région au Sud des établissements Français en Algérie, &c.** Par M. le Lieut. Col. Daumas. 8vo. Paris, 1845. From Mr. A. Vattermare.

**De l'organisation des Bibliothèques dans Paris.** Par le Comte de Laborde. 8me., Lettre. Étude sur la construction des Bibliothèques. 8vo. Paris, 1845. From the same.

**Movement of the international literary exchanges between France and North America, from Jan. 1845 to May 1846; with instructions for collecting, preparing, and forwarding objects of natural history, written by the Prof. administrators of the Museum of Natural History at Paris; and instructions relative to Anthropology and Zoology.** By M. Isidore Geoffroy St. Hilaire. 8vo. Paris, 1846. From the same.

**Proceedings of the American Academy of Arts and Sciences,** pp. 49—160. From the Academy.

**Die Petrefacten der Trias und des Jura sowie der Tertair- und Diluvial Bildungen Württembergs, nach ihren Schichtungsverhältnissen zusammengestellt mit 'geognostischem Durchschnitt von P. Mohr.** 8vo. pamphlet. Stuttgart, 1847. From the author.

**Verzeichniss von Mineralien und Gebirgsarten bei Paul Mohr.** From the author.

Dr. Wilson deposited the following works:

- History of British Animals. By John Fleming, D. D., F. R. S., &c. 2d edition. 8vo. London, 1842.
- The Philosophy of Zoology; or a general view of the structure, functions and classifications of animals. By John Fleming, D. D., &c. 2 vols., 8vo. Edinburgh, 1822.
- The Naturalist's Library. Vols. 3, 4, 5, 6 and 13, of Ornithology. 12mo.
- Untersuchungen über die Fauna Peruana auf einer Reise in Peru Während der Jahre 1838, '39, '40, '41 and '42. Von Dr. J. J. von Tschudi. Leiferungen 1—12. 4to.
- A collection of geological facts and practical observations intended to elucidate the formation of the Ashby coal field, in the parish of Ashby-de-la-Zouch, and the neighboring district. By Edward Mammatt, F. G. S. 1 vol. 4to. Ashby-de-la-Zouch, 1836.
- Antediluvian Phytology, illustrated by a collection of the fossil remains of plants peculiar to the coal formation of Great Britain. By Edmund Tyrrell Artis, F. S. A. F. G. S. 4to. London, 1838.
- Handbuch der Naturgeschichte aller Vögel Duetschlands. Von. Christian Ludwig Brehm. 8vo. Ilmenau, 1831.
- A Monograph of the British Nudibranchiate Mollusca; with figures of all the species. By Joshua Alder & Albany Hancock. Parts 1, 2, and 3. 4to. London, 1845, '46.
- The Viviparous Quadrupeds of North America. By Audubon & Bachman. No. 24, folio.
- Proceedings of the Zoological Society of London, pp. 83 to 98.
- The Annals and Magazine of Natural History. No. 131. Aug., 1847.

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The following letter was read from Dr. J. W. Dawson, of Pictou, N. S., dated Sept. 11, '47, addressed to Prof. Johnson, in answer to some inquiries made by the latter, respecting the gypsum of that section of country.

"The gypsum of Nova Scotia has attracted considerable attention since Mr. Lyell published his reasons for supposing it to be older than had been previously supposed, and you will find much matter relating to your inquiries, in papers by Mr. Lyell, Mr. Brown of Sidney, and myself, published, within the last few years, by the Geological Society of London. I do not, therefore, profess, in this letter, to state much that is new, but merely to give you a general view of the appearances I have observed, and the conclusions deducible from them.

The great workable deposits of gypsum are all contained in the carboniferous system, and most of them in its lower part. The new red sandstone contains only small veins and thin layers of gypsum, of no economical importance. For proof of this, I may refer you to the papers above mentioned, and to that on the new red sandstone, which I hope will be published in the course of this year.

The great masses of gypsum quarried in this Province, are the outcropping edges of true beds, apparently as continuous as those of the limestone associated with them, though perhaps not so much so as the accompanying sandstone and shale. These beds are, however, often of great thickness, and this, together with the tendency of their surfaces to be worn into "pits," their association with soft marls and sandstones easily removed by denudation, and the disturbances to which our carboniferous strata have been subjected, often prevent their arrangement from being distinctly seen. In the following places, however, it is very evident:

At Ogden's Point, near Antigonish, the descending order, seen in the coast section, is as follows:

- |   |                                      |
|---|--------------------------------------|
| 1. White gypsum, fine grained and rather hard, in thick laminae, and with minute crystals of carbonate of lime. | } Aggregate thickness over 100 feet. |
| 2. Reddish gypsum, large grained foliated.  |                                      |
| 3. Alternations of thin beds of gypsum and of grey earthy limestone.  |                                      |
| 4. Grey limestone, laminated and brecciated, a thick bed.   |                                      |
| 5. Reddish sandstones and shales.   |                                      |

The dip of these beds is S. S. E. 25°, and the lamination or subordinate bedding of the upper bed of gypsum, coincides with this dip. The beds can be traced inland for several miles; the outcrop of the gypsum running parallel to that of the other beds.

A section somewhat similar to the above, occurs at De Bert river, but there the limestone, which is fossiliferous, does not alternate with the gypsum at their junction; the gypsum is, however, evidently a bed superimposed on the limestone.

Two of the smaller beds near the mouth of the Shubenacadie river, afford good illustrations of the bedding of the gypsum. The first is a bed of black gypsum, on the west side of the river. It is 12 feet thick, and is included in beds of reddish sandstone, a layer of which separates the gypsum into two portions. In this case the contrast between the color of the red sandstone and that of the gypsum, apparently colored by coaly or bituminous matter, is very striking. The other instance occurs on the east side of the river, at the southern extremity of the bay, named the "Bend." It is a bed of whitish anhydrite, with some common gypsum in its upper part, regularly interstratified with reddish sandstones. Near this bed the red sandstones are traversed by a network of very narrow veins of fibrous gypsum.

Near the entrance of Wallace Harbor is a bed of gypsum, whose relations are as follow, in descending order :

1. Reddish clay or shale, not well seen.
2. Grey limestone with fossil shells. Its fissures and the cavities of the shells filled with selenitic gypsum.
3. White granular gypsum ; thickness about 12 feet.
4. Reddish clay and shales.
5. Grey sandstone, with calamites and trunks of coniferous trees.

The dip of these beds is S. S. W. 20°.

The above are the best illustrations which, on looking over my notes, I can find of the stratification of gypsum. There is, however, one circumstance worthy of notice, in addition, as it aids in generalizing from such facts. It is the rude lamination or layering observed in many masses of gypsum. This always coincides with the plans of stratification, where the latter can be observed, and is often produced by the presence of thin layers of clay, marl, or limestone. In beds whose associated rocks cannot be seen, this lamination is often observable, and affords an evidence of stratification, which may sometimes be farther confirmed by a comparison with the nearest visible beds of other rocks. In some cases also, this layering affords proofs of disturbances. An instance of this is the enormous bed of gypsum, called White's or the Big Plaster Rock, on the banks of the Shubenacadie. The indications of the singularly contorted laminæ of this bed are confirmed by the vertical position of some associated thin beds of marl and limestone.

Anhydrite very frequently accompanies the common gypsum. In some cases, as at White's quarry, and the bend of the Shubenacadie, it forms the lower parts of beds, which above consist of hydrous gypsum. In other instances, as at the estuary of the Avon and the St. Croix river, it constitutes the mass of great beds, which are, however, in the immediate vicinity of the beds of the common variety. At the East river of Pictou, it occurs in large balls, included in a thick bed of hydrous gypsum. The anhydrite is sometimes also disseminated in grains, through some parts of the beds of gypsum, which are quarried ; and this mixed rock, as well as the purer anhydrite, is called *hard plaster* or *shark-stone*, by the quarrymen. Anhydrite has not been observed to be connected with any igneous or metamorphosed rocks. In the only instance which I have observed of the occurrence of gypsum in rocks altered by heat, the gypsum is hydrous.

The gypsum of this province is nearly always crystalline. In the great beds, whether of common gypsum or anhydrite, the structure is always foliated or granular ; sometimes large grained, in other cases so fine as to appear compact or chalky. The finer grained varieties often contain groups of larger crystals. In the true veins, occupying fissures in the sandstones, limestones, and gypsum beds themselves, the structure is invariably fibrous. Little rounded kernels of gypsum, sometimes occurring in sandstones, &c., are foliated.

The crystalline structure, and great comparative purity of gypsum, show that it is a chemical, not a mechanical deposit. Its constant association with the limestones of the carboniferous system, containing marine fossils, (*Terebratula*, *Productus*, *Orthoceras*, *Corals*, &c.) prove that it was deposited in the sea ; and

from the present relations of the carboniferous rocks to older systems, in this province, it is probable that the sea basins in which gypsum was deposited, were not very extensive. In these sea basins the deposition of gypsum alternated with mechanical deposits of sand and marl, and with the growth of shells and corals; but the conditions which produced beds of gypsum, were unfavorable both to the transport of sediment and the existence of animals or plants.

From a consideration of these facts, I am disposed to refer the formation of gypsum to springs and rivers, containing free sulphuric acid, and poured into seas in which carbonate of lime had been deposited. The sulphuric acid may have been derived from the volcanic regions of the neighboring ranges of older rocks, and may have been a product of the oxidation of iron pyrites, which still abound in some parts of these older strata, either directly by the action of air and water, or, perhaps, indirectly by the formation of sulphuretted hydrogen, and its oxidation in passing through fissures in contact with water and air. To realize the operation of these causes, you need only imagine streams like the South American *Rio Vinaigre* flowing into a sheltered bay containing beds of shells and corals, or into the space between a coast and its coral reef. I do not, however, pretend to explain the mode of former action of anhydrite in this way, though it, like the common gypsum, has evidently been deposited in beds by water."

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A letter was read from Dr. S. P. Hildreth, of Marietta, Ohio, dated Aug. 19, 1847, relative to his donation of this evening.

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On motion of Mr. Haldeman, a committee was appointed to confer with Mr. A. Vattermare, on the subject of international exchanges. Committee, Prof. Johnson, Dr. Leidy and Mr. Cassin.

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*Stated Meeting, October 12, 1847.*

VICE PRESIDENT MORTON in the Chair.

DONATIONS TO MUSEUM.

Forty specimens, in skin, of European birds. From Prof. Bronn, of Heidelberg, in exchange.

*Meandrina cerebriformis*, attached to *Arca Noæ*, *M. crispa* with *Serpula* and *Pyrgonia*; *Agaricia ampliata* with *Pyrgonia*, *Pocilipora damicornis*; *Megaphyllum* with *Nobia*. From Dr. Wilson.

A mineral, supposed to be new. From Mr. L. J. Germain.